

Claims

1. A nucleic acid molecule encoding a branching enzyme from a bacterium of the genus *Neisseria* selected from the group consisting of
 - (a) nucleic acid molecules encoding a protein which comprises the amino acid sequence depicted in SEQ ID NO. 2;
 - (b) nucleic acid molecules comprising the coding region depicted in SEQ ID NO. 1;
 - (c) nucleic acid molecules encoding a protein which comprises the amino acid sequence encoded by the insert in plasmid DSM 12425;
 - (d) nucleic acid molecules comprising the coding region for a branching enzyme, which is contained in the insert of the plasmid DSM 12425;
 - (e) nucleic acid molecules encoding a protein the sequence of which has, in the first 100 amino acids, a homology of at least 65% to the amino acid sequence depicted in SEQ ID NO. 2;
 - (f) nucleic acid molecules the complementary strand of which hybridizes to a nucleic acid molecule of (a), (b), (c), (d) and/or (e) and which encode a branching enzyme from a bacterium of the genus *Neisseria*; and
 - (g) nucleic acid molecules the sequence of which deviates from the sequence of a nucleic acid molecule of (f) due to the degeneracy of the genetic code.
2. A vector containing a nucleic acid molecule according to claim 1.
3. The vector according to claim 2, wherein the nucleic acid molecule is linked in sense-orientation to regulatory sequences guaranteeing the transcription in prokaryotic or eukaryotic cells.
4. A host cell which is genetically modified with a nucleic acid molecule according to claim 1 or with a vector according to claim 2 or 3.
5. A method for producing a branching enzyme from a bacterium of the genus *Neisseria*, wherein a host cell according to claim 4 is cultivated under conditions

allowing the expression of the protein, and wherein the protein is isolated from the cultivated cells and/or the culture medium.

6. A method for producing a branching enzyme from a bacterium of the genus *Neisseria*, wherein the protein is produced in an in-vitro transcription and translation system using a nucleic acid molecule according to claim 1.
7. A protein encoded by a nucleic acid molecule according to claim 1 or obtainable by a method according to claim 5.
8. An antibody which specifically recognises a protein according to claim 7.
9. Use of a protein according to claim 7 for producing α -1,6-branched α -1,4-glucans in in-vitro systems.
10. A transgenic plant cell containing a nucleic acid molecule according to claim 1, wherein the nucleic acid molecule is linked to regulatory sequences guaranteeing the transcription in plant cells.
11. The transgenic plant cell according to claim 10, wherein the nucleic acid molecule is linked to a sequence encoding a signal sequence which guarantees the localisation of the encoded protein in the plastids of the cells.
12. A transgenic plant containing plant cells according to claim 10.
13. A method for producing a transgenic plant, wherein
 - (a) a plant cell is genetically modified by introducing a nucleic acid molecule according to claim 1 or a vector according to claim 2 or 3;
 - (b) a plant is regenerated from the cell produced according to step (a); and
 - (c) optionally further plants are produced from the plant produced according to step (b).

14. Harvestable parts of plants according to claim 1, wherein said parts of plants contain transgenic plant cells.
15. Starch obtainable from transgenic plant cells according to claim 1 or from parts of plants containing said transgenic plant cells.
16. The starch according to claim 15, wherein the composition of the starch is modified in such a way that it has an increased gel texture and/or a reduced phosphate content and/or a reduced peak viscosity and/or a reduced pastification temperature and/or a reduced size of the starch granules and/or a modified distribution of the side-chains in comparison with the starch from corresponding wild type plants.